

SECTION 09300

TILE

PART 1 - GENERAL

0.1 DESCRIPTION OF WORK

A. Work Included: This Section specifies the following items:

1. Floor tile.
2. Wall tile.
3. Stone thresholds installed as part of tile installations.
4. Waterproof membrane for thin-set tile installations.
5. Crack-suppression membrane for thin-set tile installations.
6. Surface preparation for tile and accessories.
7. Installation of access doors in gypsum board assemblies, furnished under mechanical and electrical sections.

B. Related Work: The following items are not included in this Section and will be performed under the designated Sections:

1. Section 03300 - CAST-IN-PLACE CONCRETE; monolithic slab finishes specified for tile substrates.
2. Section 07920 - JOINT SEALANTS; sealing of expansion, contraction, control, and isolation joints in tile surfaces.
3. Section 09260 - GYPSUM BOARD ASSEMBLIES; cementitious backer units.
4. Section 09360 - MODULAR TACTILE SURFACES.

0.2 PERFORMANCE REQUIREMENTS

A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:

1. Level Surfaces: Minimum 0.6.
2. Step Treads: Minimum 0.6.
3. Ramp Surfaces: Minimum 0.8.

0.3 SUBMITTALS

A. Product Data: For each type of product indicated.

- B.** Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- C.** Samples for Verification:
 - 1. Assembled samples with grouted joints for each type and composition of tile and for each color and finish required, at least 12 inches square and mounted on rigid panel. Use grout of type and in color or colors approved for completed work. Include sealant specified in Section 07920 - JOINT SEALANTS, in color approved for completed work.
 - 2. Full-size units of each type of trim and accessory for each color and finish required.
 - 3. Stone thresholds in 6-inch lengths.
 - 4. Metal edge strips in 6-inch lengths.
- D.** Qualification Data: For Installer.
- E.** Material Test Reports: For each tile-setting and -grouting product.
- F.** Installation Bonding Report: Including dates sounding test performed and remedial action taken.

0.4 QUALITY ASSURANCE

- A.** Source Limitations for Tile: Obtain all tile of same type and color or finish from one source or producer.
 - 1. Obtain tile from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B.** Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from a single manufacturer and each aggregate from one source or producer.
- C.** Source Limitations for Other Products: Obtain each of the following products specified in this Section through one source from a single manufacturer for each product:
 - 1. Stone thresholds.
 - 2. Waterproofing.
 - 3. Joint sealants.
 - 4. Cementitious backer units.
 - 5. Metal edge strips.

0.5 DELIVERY, STORAGE, AND HANDLING

- A.** Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement in ANSI A137.1 for labeling sealed tile packages.
- B.** Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C.** Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D.** Store liquid additives in unopened containers and protected from freezing.

0.6 PROJECT CONDITIONS

- A.** Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

PART 2 - PRODUCTS

0.1 TILE SCHEDULE

- A.** Floor Tile FT-1: Interior floor installation on concrete; cement mortar bed (thickset) bonded to concrete; TCA F112 and ANSI A108.1A.
 - 1. Tile Type: Unglazed paver tile as selected by Engineer.
 - 2. Grout: Polymer-modified unsanded grout.
 - 3. Joint Width: 1/16 inch.
- B.** Floor Tile FT-2: Interior floor installation on concrete; thin-set mortar; TCA F113 and ANSI A108.5.
 - 1. Tile Type: Unglazed ceramic mosaic as selected by Engineer.
 - 2. Thin-Set Mortar: Latex-Portland cement mortar.
 - 3. Grout: Polymer-modified unsanded grout.
 - 4. Joint Width: 1/16 inch.
- C.** Floor Tile FT-3: Interior floor installation on concrete; thin-set mortar, epoxy grout; TCA F115 and ANSI A108.5.
 - 1. Tile Type: Unglazed paver tile as selected by Engineer.
 - 2. Thin-Set Mortar: Latex-Portland cement mortar.
 - 3. Grout: Chemical-resistant, water-cleanable, tile-setting and -grouting epoxy.
 - 4. Joint Width: 1/8 inch.

- D.** Floor Tile FT-4: Interior floor installation on waterproof membrane over concrete; thin-set mortar; TCA F122 and ANSI A108.5.
1. Tile Type: Unglazed ceramic mosaic tile as selected by Engineer.
 2. Thin-Set Mortar: Latex-Portland cement mortar.
 3. Grout: Polymer-modified unsanded grout.
 4. Joint Width: 1/16 inch.
- E.** Wall Tile Installation WT-1: Interior wall installation over sound, dimensionally stable masonry or concrete; thin-set mortar; TCA W202 and ANSI A108.5.
1. Tile Type: Glazed ceramic tile as selected by Engineer.
 2. Thin-Set Mortar: Latex-Portland cement mortar.
 3. Grout: Polymer-modified unsanded grout.
 4. Joint Width: 1/16 inch.
- F.** Wall Tile Installation WT-2: Interior wall installation over gypsum board; thin-set mortar; TCA W243 and ANSI A108.5.
1. Tile Type: Glazed ceramic tile as selected by Engineer.
 2. Thin-Set Mortar: Latex-Portland cement mortar.
 3. Grout: Polymer-modified unsanded grout.
 4. Joint Width: 1/16 inch.
- G.** Wall Tile Installation WT-3: Interior wall and shower-receptor installation over cementitious backer units; thin-set mortar; TCA B415, TCA W244, and ANSI A108.5.
1. Tile Type: Glazed ceramic tile as selected by Engineer.
 2. Thin-Set Mortar: Latex-Portland cement mortar.
 3. Grout: Polymer-modified unsanded grout.
 4. Joint Width: 1/16 inch.

0.2 PRODUCTS, GENERAL

- A.** ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.
1. Provide tile complying with Standard grade requirements, unless otherwise indicated.
- B.** ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI standards referenced in this Section.
- C.** Factory Blending: For tile exhibiting color variations within ranges selected during Sample submittals, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

- D.** Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer, unless otherwise indicated.
- E.** Tile Trim Units: Matching characteristics of adjoining flat tile and coordinated with sizes and coursing of adjoining flat tile where applicable. Provide shapes selected from manufacturer's standard shapes.
- F.** Marble Thresholds: Uniform, fine- to medium-grained white stone with gray veining, ASTM C 503 with a minimum abrasion resistance of 10 per ASTM C 1353 or ASTM C 241 and with honed finish. Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes. Bevel edges at 1:2 slope, aligning lower edge of bevel with adjacent floor finish. Limit height of bevel to 1/2 inch or less, and finish bevel to match face of threshold.
- G.** Waterproofing and Crack Suppression Membranes: Manufacturer's standard product that complies with ANSI A118.10.
- H.** Trowelable Underlayments and Patching Compounds: Latex-modified, Portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
- I.** Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

0.3 ELASTOMERIC SEALANTS

- A.** General: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer and characteristics indicated that comply with applicable requirements in Section 07920 - JOINT SEALANTS.
- B.** Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints, unless otherwise indicated.
- C.** One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.

1. Available Products or equal:

- a. Dow Corning Corporation; Dow Corning 786.
- b. GE Silicones; Sanitary 1700.
- c. Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
- d. Tremco, Inc.; Tremsil 600 White.

- D.** Multipart, Pourable Urethane Sealant for Use T: ASTM C 920; Type M; Grade P; Class 25; Uses T, M, A, and, as applicable to joint substrates indicated, O.

1. Available Products or equal:

- a. Bostik; Chem-Calk 550.
- b. Mameco International, Inc.; Vulkem 245.
- c. Pecora Corporation; NR-200 Urexpan.
- d. Tremco, Inc.; THC-900.

0.4 MIXING MORTARS AND GROUT

- A.** Mix mortars and grouts to comply with referenced standards, compressive strength requirements and mortar and grout manufacturers' written instructions.
- B.** Add materials, water, and additives in accurate proportions.
- C.** Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

0.1 EXAMINATION

- A.** Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
 1. Verify that substrates for setting tile are firm; dry; clean; free of oil, waxy films, and curing compounds; and within flatness tolerances required by referenced ANSI A108 Series of tile installation standards for installations indicated.
 2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.
 3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Engineer.
- B.** Proceed with installation only after unsatisfactory conditions have been corrected.

0.2 PREPARATION

- A.** Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.
- B.** Provide concrete substrates for tile floors that comply with flatness tolerances specified in referenced ANSI A108 Series of tile installation standards.
 - 1. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions. Use product specifically recommended by tile-setting material manufacturer.
 - 2. Remove protrusions, bumps, and ridges by sanding or grinding.
- C.** Blending: For tile exhibiting color variations within ranges selected during Sample submittals, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

0.3 INSTALLATION, GENERAL

- A.** ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials, to methods indicated in ceramic tile installation schedules, and resistance to deleterious substances.
- B.** TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation." Comply with TCA installation methods indicated in ceramic tile installation schedules.
- C.** Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- D.** Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- E.** Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.

1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
- F.** Lay out tile wainscots to next full tile beyond dimensions indicated.
- G.** Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
1. Locate joints in tile surfaces directly above joints in concrete substrates.
 2. Prepare joints and apply sealants to comply with requirements in Section 07920 - JOINT SEALANTS.
- H.** Grout tile to comply with requirements of the following tile installation standards:
1. For ceramic tile grouts (sand-Portland cement; dry-set, commercial Portland cement; and latex-Portland cement grouts), comply with ANSI A108.10.
 2. For chemical-resistant epoxy grouts, comply with ANSI A108.6.
- I.** At showers, tubs, and where indicated, install cementitious backer units and treat joints to comply with ANSI A108.11 and manufacturer's written instructions for type of application indicated.

0.4 WATERPROOFING AND CRACK-SUPPRESSION MEMBRANE INSTALLATION

- A.** Install waterproofing to comply with ANSI A108.13 and waterproofing manufacturer's written instructions to produce waterproof membrane of uniform thickness bonded securely to substrate.
- B.** Install crack-suppression membrane to comply with manufacturer's written instructions to produce membrane of uniform thickness bonded securely to substrate.
- C.** Do not install tile over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

0.5 FLOOR TILE INSTALLATION

- A.** General: Install tile to comply with requirements in the Floor Tile Installation Schedule, including those referencing TCA installation methods and ANSI A108 Series of tile installation standards. For installations indicated below, follow procedures in ANSI A108 Series tile installation standards for providing 95 percent mortar coverage.

1. Perform sounding test by method using a chain dragged over the surface. Remove and reset tiles which fail the sounding test.
- B.** Stone Thresholds: Install stone thresholds at locations indicated; set in same type of setting bed as abutting field tile, unless otherwise indicated. Set thresholds in latex-Portland cement mortar for locations where mortar bed would otherwise be exposed above adjacent nontile floor finish.
- C.** Metal Edge Strips: Install at locations indicated or where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with top of tile.

0.6 WALL TILE INSTALLATION

- A.** Install types of tile designated for wall installations to comply with requirements in the Wall Tile Installation Schedule, including those referencing TCA installation methods and ANSI setting-bed standards.

0.7 CLEANING AND PROTECTING

- A.** Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 1. Remove grout residue from tile as soon as possible.
 2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
 3. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent it from clogging drains.
- B.** When recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.
- C.** Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed. After seven days, cover areas subject to construction traffic with heavy cardboard.
- D.** Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

PART 4 - MEASUREMENT AND PAYMENT

0.1 MEASUREMENT

- A. Tile will be measured as per square foot complete in place, including all preparation, accessories and incidentals.

0.2 PAYMENT

- A. Payment for tile will be made at the Contract unit price for the quantities as specified above.

0.3 PAYMENT

ITEM NO.	DESCRIPTION	UNIT
0930.100	TILE WORK	SF

END OF SECTION